UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,792	10/26/2006	Hiroyuki Kamiya	2006_1315A	9531

513 7590 05/13/2009

WENDEROTH, LIND & PONACK, L.L.P.
1030 15th Street, N.W.,
Suite 400 East
Washington, DC 20005-1503

EXAMINER	
PANDE, SUCHIRA	

ART UNIT	PAPER NUMBER
1637	

MAIL DATE	DELIVERY MODE
05/13/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,792	KAMIYA ET AL.	
	Examiner	Art Unit	
	SUCHIRA PANDE	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-22* is/are pending in the application.

4a) Of the above claim(s) *17-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 22, 2008 has been entered.

Claim Status

2. Claim 12 has been amended; claims 1-11 are cancelled; and claims 17-22 are withdrawn. Consequently claims 12-16 are active and will be examined in this action.

Claim Interpretation

3. The amended claim language "prepared by cleavage from a single-stranded circular DNA" is not being given weight because instant method claim recited only requires introduction of a single –stranded DNA fragment. The product by process step as to how the single stranded DNA fragment was prepared is merely descriptive, since it is not recited as an active step.

Response to Arguments

Re 112 1st rejection of claims 12-16

4. Applicant has amended base claim 12 to limit the scope of claimed invention to in vitro method. This amendment obviates the 112 1st scope of enablement rejection of claims 12-16. Accordingly the 112 1st rejections of claims 12-16 is being withdrawn.

Re 103 rejection of claims 12-16 over Grunert et al. Moriya and Marron et al.

5. Applicant's arguments with respect to claims 12-16 have been considered but are moot in view of the new ground(s) of rejection. Amended claims are drawn to an *in vitro* method thus the scope of the amended claim is changed. The previously cited art is no longer applicable to amended claim. Hence 103 rejections of claims 12-16 over Grunert et al. Moriya and Marron et al. is withdrawn. New art is being cited that teaches all the aspects of amended claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriya (1993) Proc. Natl. Acad. Sci. USA vol. 90 pp1122-1126 (previously cited) in view of Zarling et al. (US PG PUB 2004/0019916 A1 with priority back to 1997).

Regarding claim 12, Moriya teaches an in vitro base conversion method of a DNA sequence (see title where targeted base conversion in simian kidney cells is taught. Thus Moriya teaches an in vitro base conversion method of a DNA sequence),

which is a method of converting one or more bases in a target DNA sequence in a cell (see page 1124 section neo Transformation of COS ts2 with ss PMS2(8-oxodG). Here neo gene is the target DNA sequence in a COS cell),

consisting of introducing a single-stranded DNA (see page 1123 line 1 where ssPMS2 DNA is taught. Thus by teaching ssPMS2 DNA, Moriya teaches a single-stranded DNA. See page 1122 right side col. par. 1 where ss shuttle phagemid vector is taught. By teaching ss shuttle phagemid vector, Moriya teaches introduction of single-stranded DNA into the hosts used to shuttle between. Thus teaching introducing a single-stranded DNA)

fragment which is prepared by cleavage from a single-stranded circular DNA (see page 1122 Materials and method section where presence of hairpin structure containing *EcoRV* and *SalI* in pMS2 is taught. This hairpin structure containing *EcoRV* and *SalI* is used to linearize ssPMS2. Thus Moriya teaches cleavage of (ssPMS2) a single-stranded circular DNA using restriction enzymes to prepare a fragment)

into a cell (see page 1123 Results section where transfection of COS cells with ss pMS2 is taught. By teaching transfection, Moriya teaches introducing ss fragment into cells),

Regarding claim 13, Moriya teaches wherein the single-stranded circular DNA is a phagemid DNA (see above as described in claim 12).

Regarding claim 12, Moriya does not teach :

a fragment having 300 to 3,000 bases,

is homologous with the target DNA sequence, and

contains the base(s) to be converted, into a cell,

wherein the single-stranded DNA fragment is homologous with either a sense strand or an antisense strand of the target DNA.

Regarding claim 12, Zarling et al. teaches a fragment having 300 to 3,000 bases (see page 19 par. 0150, where wild type CFTR 491 mer ssDNA fragment is taught. By teaching fragment of 491 mer Zarling et al. teach a fragment having 300 to 3,000 bases) is homologous with the target DNA sequence, and contains the base(s) to be converted (see page 19 par. 0150 where CFTR genomic DNA containing a 3bp ΔF508 deletion is taught as the target that is homologous to the Wild type CFTR sequence contained in the 491 mer ss DNA fragment),

wherein the single-stranded DNA fragment is homologous with either a sense strand or an antisense strand of the target DNA (see page 16 par. 0132 where selection of 491 bp region of the CFTR gene spanning exon 11 and containing 3' and 5' flanking

intron sequences from published data is described. This 491 bp region from wild type CFTR gene contains both the strands.

Thus based on which strand (+ or – strand) of the 491 bp is produced as single strand from the phagemid vector taught by Moriya, one will get the single-stranded DNA fragment is homologous with either a sense strand or an antisense strand of the target DNA.

Regarding claim 14, Zarling et al. teaches wherein the single-stranded DNA fragment is homologous with a sense strand of the target DNA sequence (see page 16 par. 0133 and 0134 where 491 bp PCR fragment is denatured to produce two single stranded 491 base sequences. Each of the denatured strands are coated with recA protein and introduced into cells. Thus by teaching mixture of both sense and antisense strands Zarling et al. teaches wherein the single-stranded DNA fragment is homologous with a sense strand of the target DNA sequence).

Regarding claim 15, Zarling et al. teaches wherein the target DNA sequence in the cell is a DNA sequence causing a disease due to the one or more bases (see page 16 par. 0131 where target DNA associated with CFTR gene is taught. CFTR is associated with human disease cystic fibrosis. See page 19 par. 0150 where CFTR genomic DNA containing a 3bp ΔF508 deletion is taught as the target that causes disease)

Regarding claim 16, Zarling et al. teaches wherein one or more bases in a target DNA sequence in a cell of an organism are converted (see page 18 par. 0147 where

homologous recombination between the targeting polynucleotide comprising WT CFTR and ΔF508 mutant cellular DNA allelic target in transfected-CF-cells is taught)

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to practice the method of Zarling et al. in the method of Moriya. The motivation to do so is provided to one of ordinary skill in the art by knowledge of art itself.

One of ordinary skill in the art knows that based on the size of the target one can clone appropriate size fragment in the multiple cloning site of the chosen phagemid vector.

Further one of ordinary skill in the art knows that shuttle phagemid vectors have architecture that allows one to express the desired (+ also referred as sense strand) or (- also referred as antisense strand). So the desired sense or antisense strand of desired DNA can be produced as single stranded DNA and this single stranded DNA can be introduced into the chosen cell to be transfected as taught by Moriya.

One of ordinary skill in the art also has a reasonable expectation that by practicing the method of Zarling et al. in the method of Moriya, preparations of desired (either sense or antisense) single stranded DNA obtained can be transfected into desired host cells to successfully perform targeted homologous recombination. See 2144.06 Art Recognized Equivalence for the Same Purpose [R-6]>II. < SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME PURPOSE

In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. An express suggestion to substitute one equivalent component or process

for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982).

Conclusion

9. All claims under consideration 12-16 are rejected over prior art.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUCHIRA PANDE whose telephone number is (571)272-9052. The examiner can normally be reached on 8:30 am -5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Suchira Pande
Examiner
Art Unit 1637

/Suchira Pande/

Examiner, Art Unit 1637